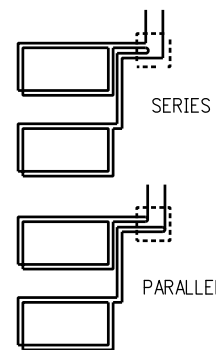


**STANDARD LOOP - WIRING AND CONNECTION TABLE**

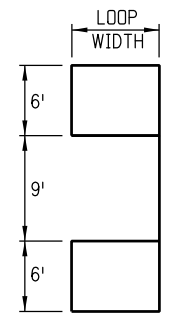
NO. OF LOOPS	WIDTH OF LOOP (FEET)									
	6	8	10	12	14	16	18	20	24-36	40+
1	4	3	3	3	3	3	3	3	2	2
2	3S	3S	3S	3P	2S	2S	2S	2S	2S	2P
3	3S	3S	2S	2S	3SP	3SP	3SP	3SP	2SP	2P
4	3SP	3SP	3SP	2SP	3SP	3SP	3SP	2SP	2SP	2SP

URNS PER LOOP AND TYPE CONNECTION  
(S = SERIES, P = PARALLEL)

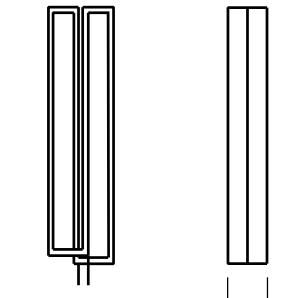
**WIRE CONFIGURATION**



**LAYOUT**



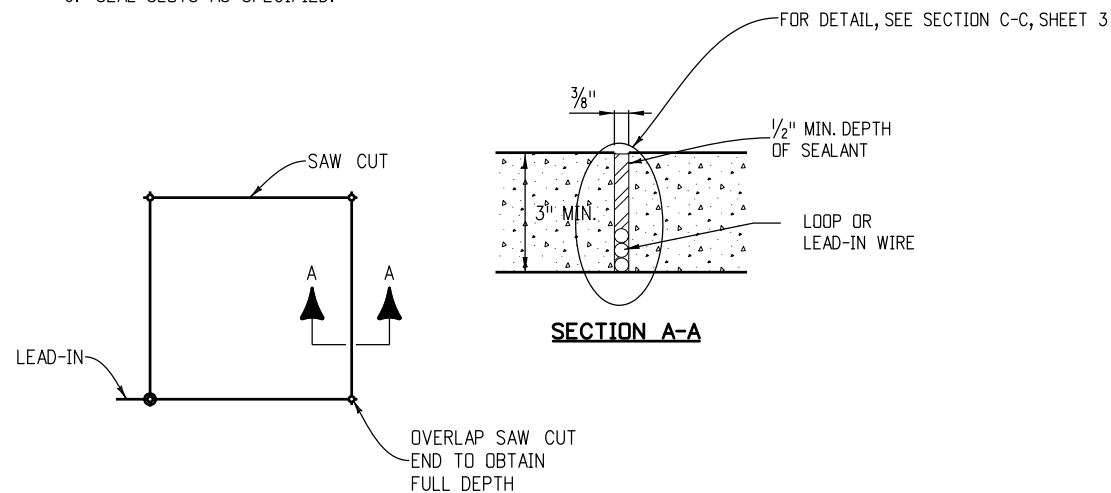
**STANDARD LOOP**



**DUAL LOOP**

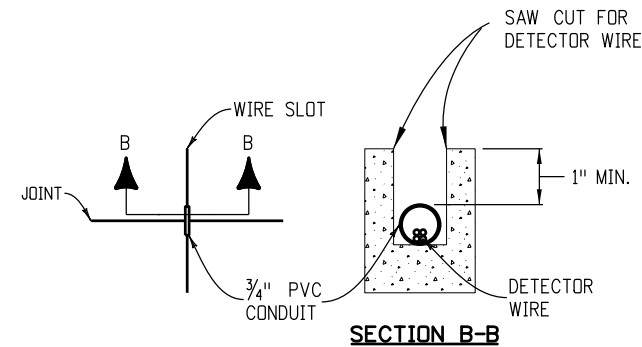
**LOOP INSTALLATION PROCEDURE**

1. CUT SLOTS IN PAVEMENT TO 3 IN. MINIMUM DEPTH.
2. CLEAN AND DRY SLOTS WITH OIL-FREE COMPRESSED AIR.
3. ONE CONTINUOUS LENGTH OF 14/1C, RHW, USE, XLPE, RHWN OR THWN WIRE SHALL BE USED FOR EACH LOOP FROM SIGNAL BASE OR PULL BOX AROUND THE LOOP WITH THE NUMBER OF TURNS SPECIFIED AND BACK TO THE SIGNAL BASE OR PULL BOX. LOOP WIRE SHALL BE DUCT TYPE.
4. USE A BLUNT, NON-METALLIC INSTRUMENT TO PUSH WIRE INTO SLOT. DO NOT COIL LEADS.
5. CONNECT DETECTOR AND TEST LOOP.
6. SEAL SLOTS AS SPECIFIED.



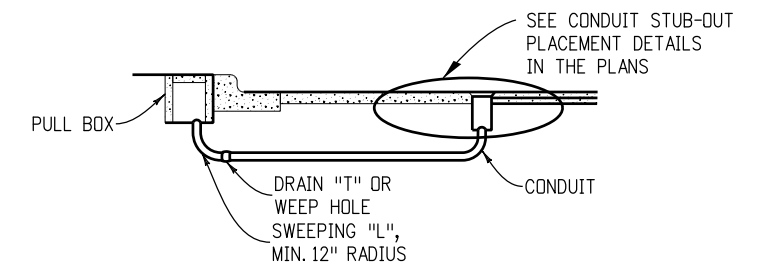
**VEHICLE DETECTOR LOOP SAW CUT DETAILS**

(FOR USE WITH VINYL TUBING ENCASED LOOP DETECTOR WIRE)



**DETECTOR WIRE ACROSS BRIDGE JOINTS**

DUAL LOOPS SHALL BE OF THE SIZE SHOWN UNLESS OTHERWISE ON THE PLANS.



**LOOP DETECTOR LEAD-IN**

**Computer File Information**

Creation Date: 07/04/12	Initials: KEN
Last Modification Date:	Initials:
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	
Drawing File Name: S-614-43_1of10	
CAD Ver.: MicroStation V8	Scale: Not to Scale Units: English

**Sheet Revisions**

Date:	Comments:
(R-X)	
(R-X)	
(R-X)	
(R-X)	

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Safety & Traffic Engineering

KCM

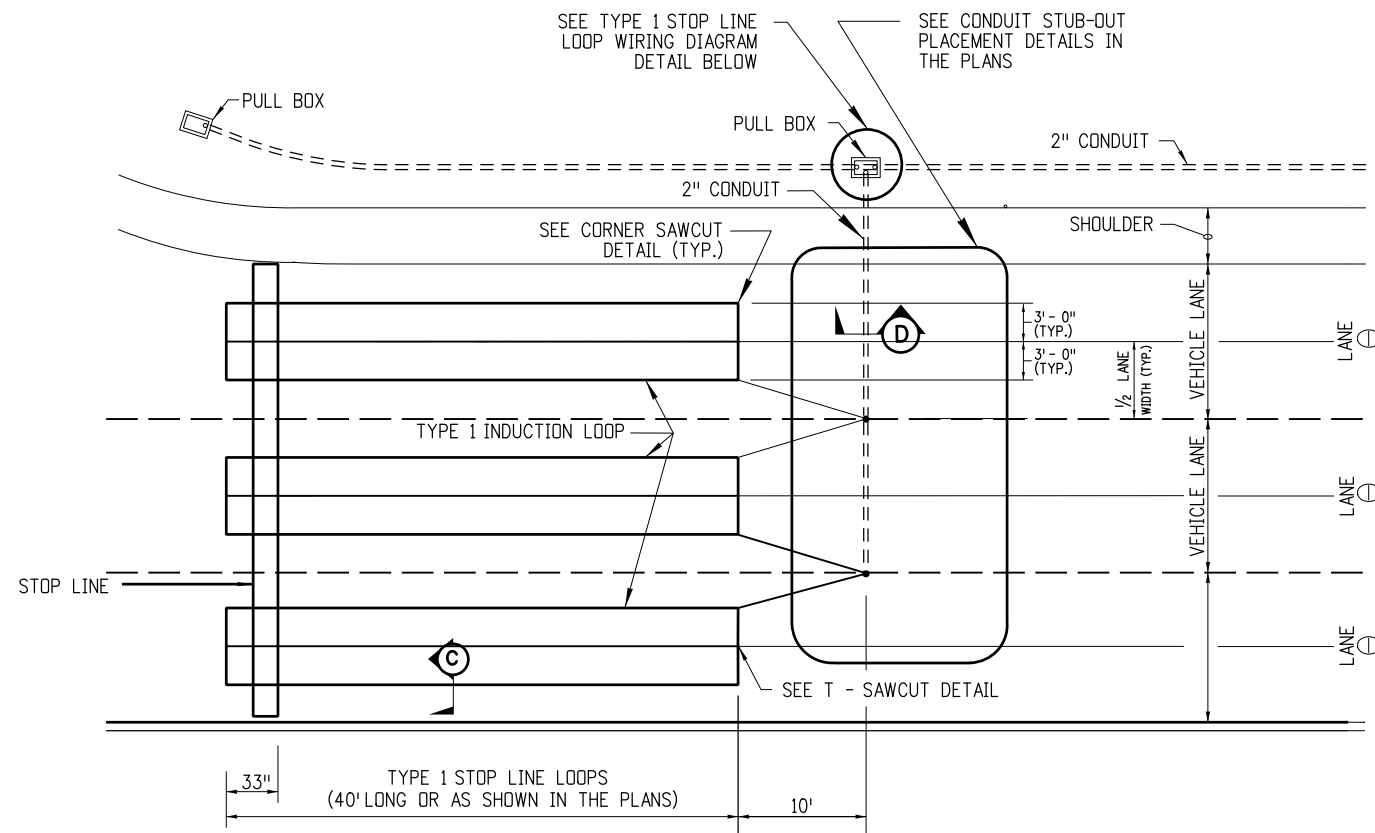
**TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS**

Issued By: Safety & Traffic Engineering Branch July 4, 2012

STANDARD PLAN NO.

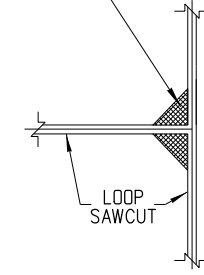
S-614-43

Sheet No. 1 of 10



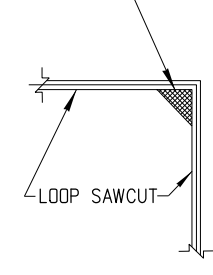
**TYPE 1 STOP LINE LOOPS - PLAN VIEW**

CHISEL OUT 1/8" TO 1/2" CORNER REMOVE PAVEMENT TO SAWCUT DEPTH AND FILL WITH SEALANT (TYP.)

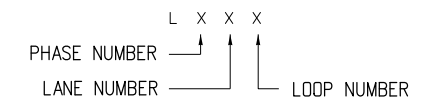


**T - SAWCUT DETAIL**

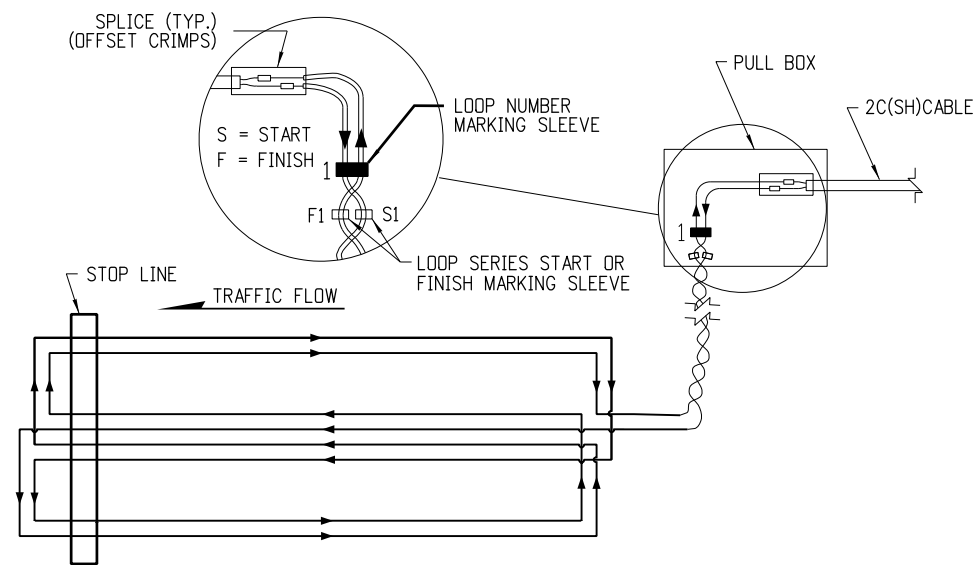
CHISEL OUT 1/8" TO 1/2" CORNER REMOVE PAVEMENT TO SAWCUT DEPTH AND FILL WITH SEALANT



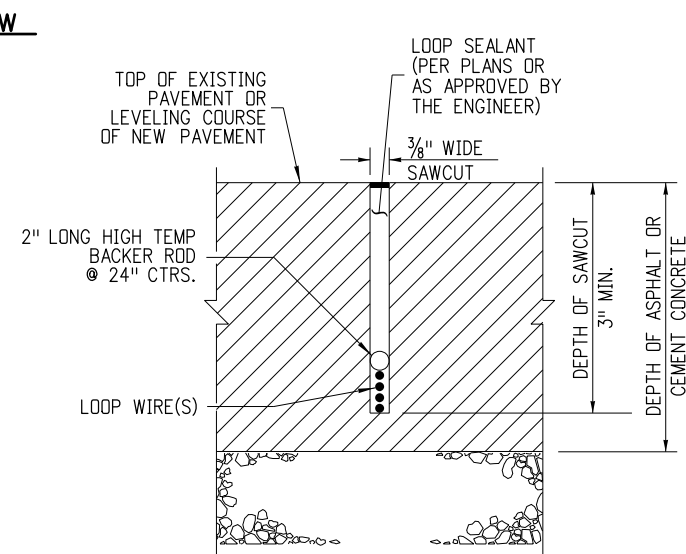
**CORNER SAWCUT DETAIL**



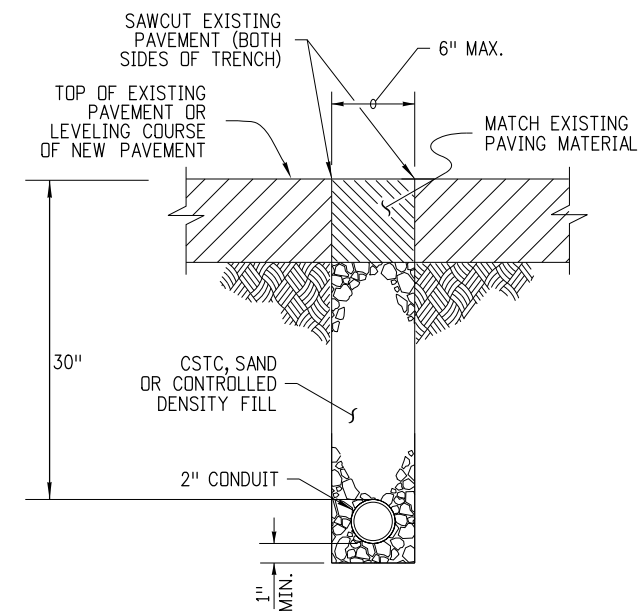
**LOOP NUMBER MARKING DETAIL**



**TYPE 1 STOP LINE LOOP WIRING DIAGRAM**



**SECTION C-C**



**SECTION D-D**

**TYPE 1 INDUCTION LOOP**

Computer File Information	
Creation Date: 07/04/12	Initials: KEN
Last Modification Date:	Initials:
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	
Drawing File Name: S-614-43_2of10	
CAD Ver.: MicroStation V8	Scale: Not to Scale Units: English

Sheet Revisions	
Date:	Comments
(R-X)	
(R-X)	
(R-X)	
(R-X)	

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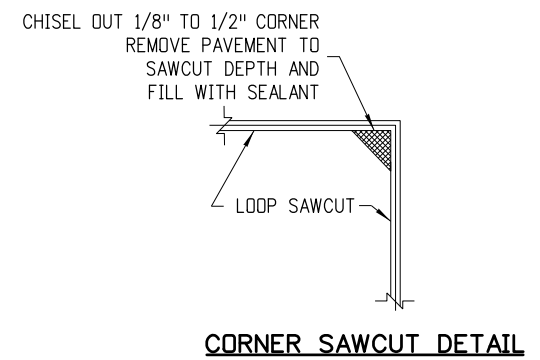
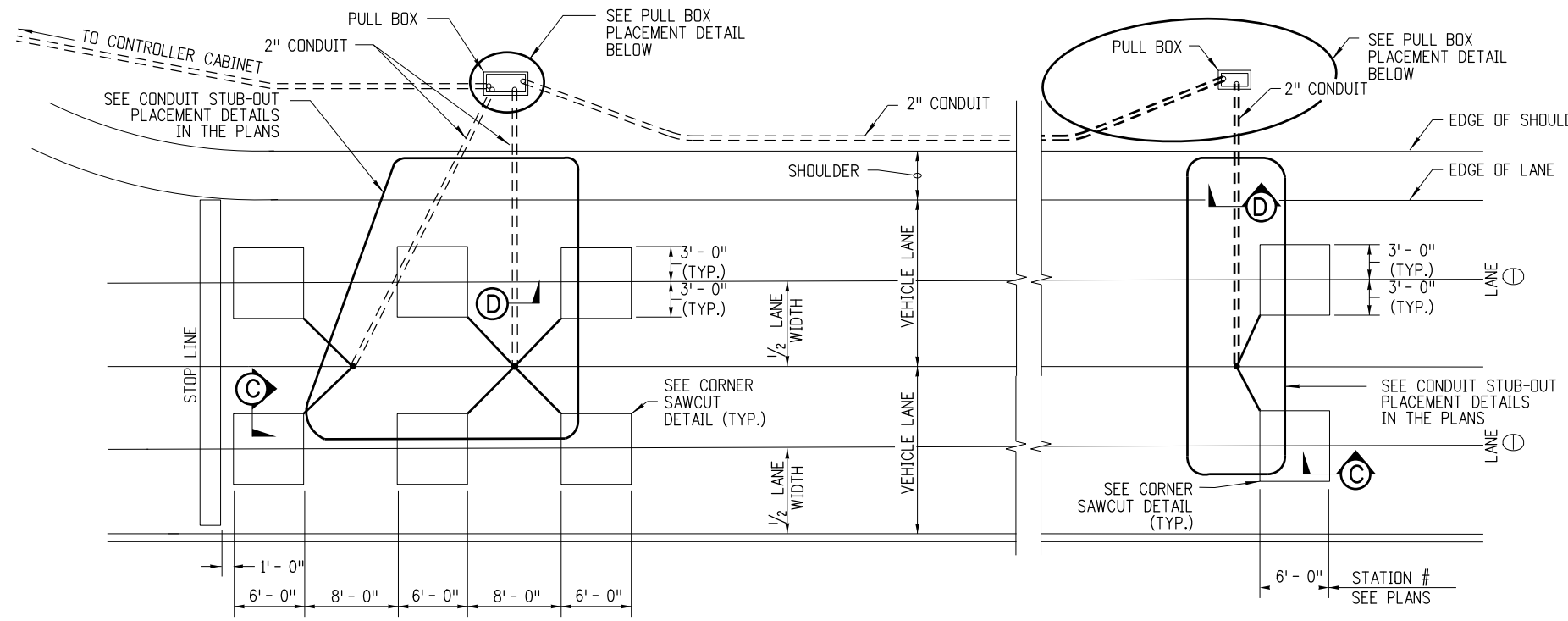
**TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS**

Issued By: Safety & Traffic Engineering Branch July 4, 2012

**STANDARD PLAN NO.**

S-614-43

Sheet No. 2 of 10

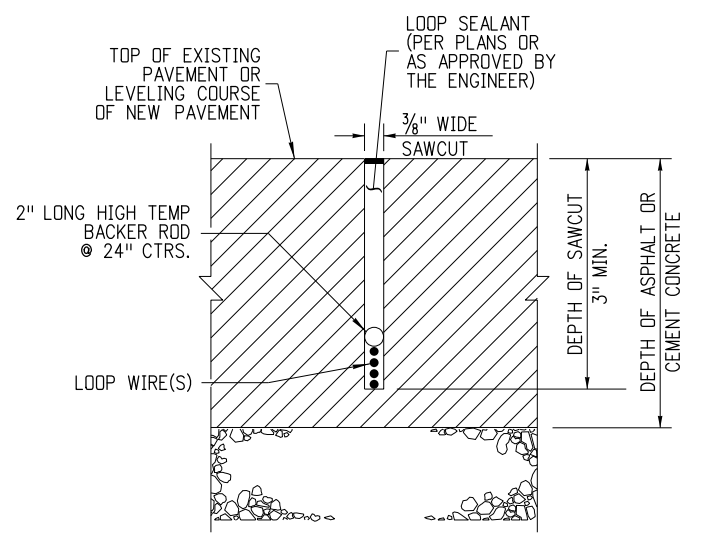


**NOTE**

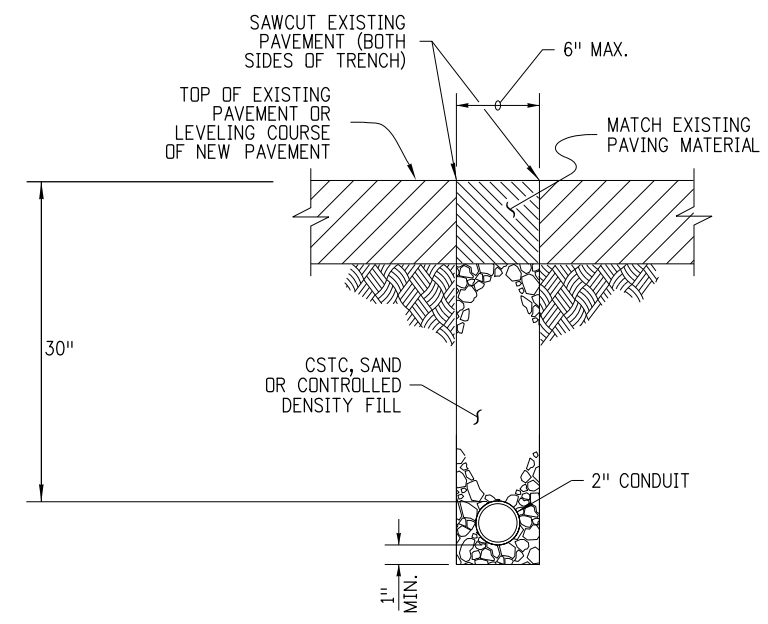
ALL OF THE LOOP LEAD-IN WIRES SHALL RETURN TO THE PULL BOX.

**TYPE 2 STOP LINE LOOPS**

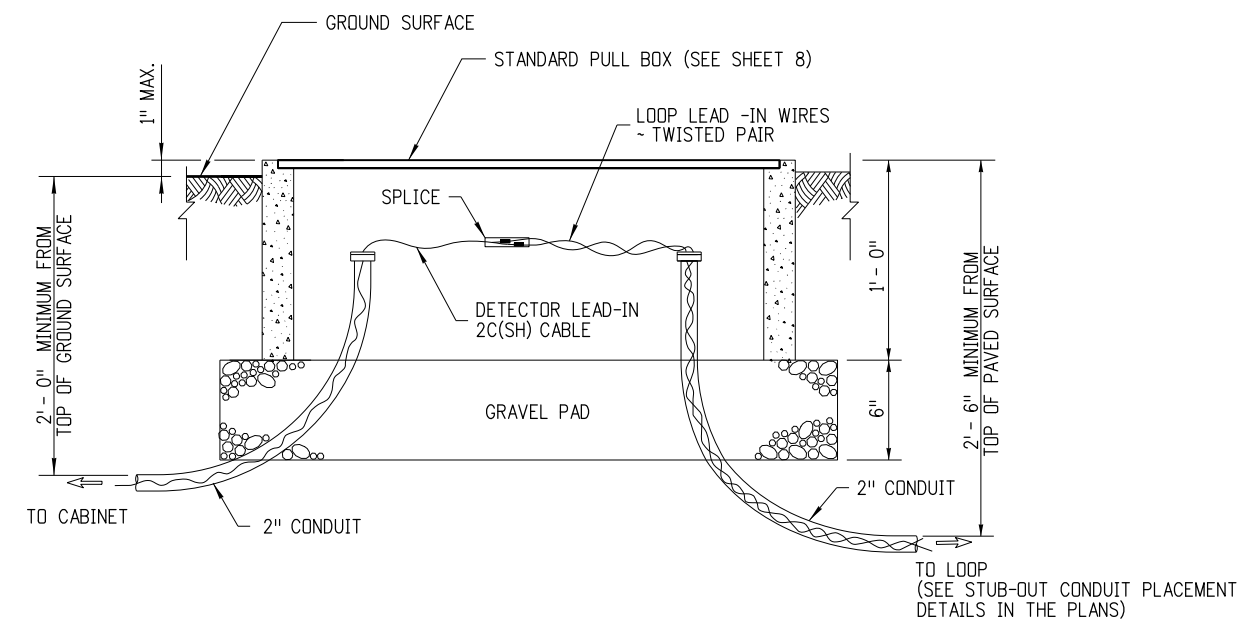
**TYPE 2 ADVANCE LOOPS**



**SECTION C-C**



**SECTION D-D**




**PULL BOX PLACEMENT DETAIL**

**TYPE 2 INDUCTION LOOPS (FOR CONVENTIONAL HIGHWAYS)**

Computer File Information	
Creation Date: 07/04/12	Initials: KEN
Last Modification Date:	Initials:
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	
Drawing File Name: S-614-43_3of10	
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	

Sheet Revisions	
Date:	Comments
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(R-X)	
(R-X)	
(R-X)	

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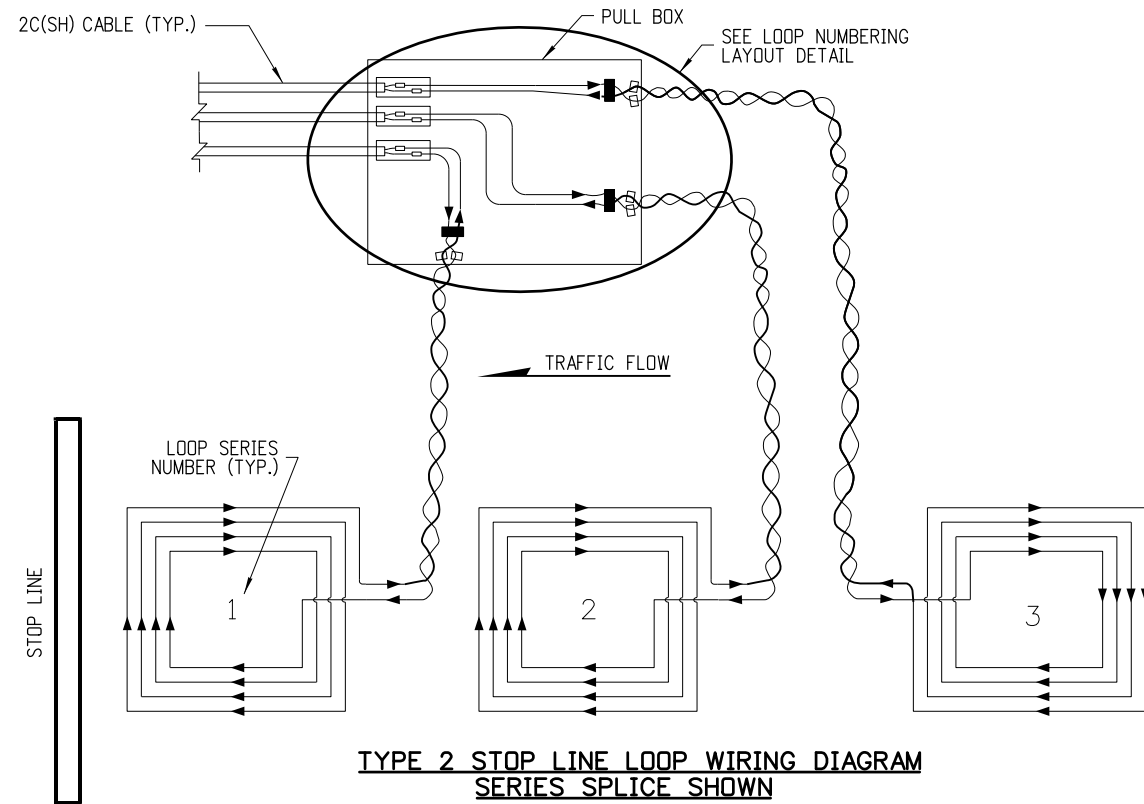
**TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS**

Issued By: Safety & Traffic Engineering Branch July 4, 2012

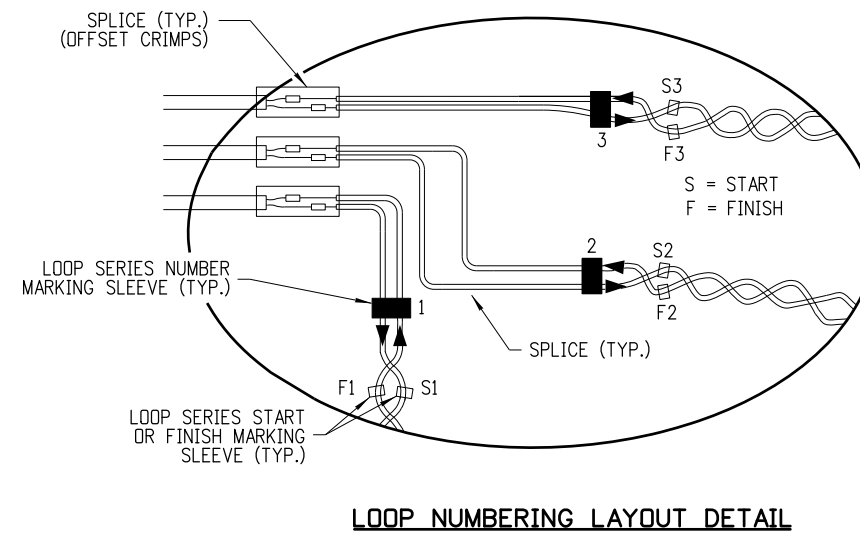
**STANDARD PLAN NO.**

**S-614-43**

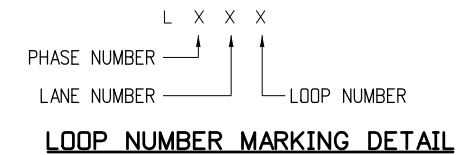
**Sheet No. 3 of 10**



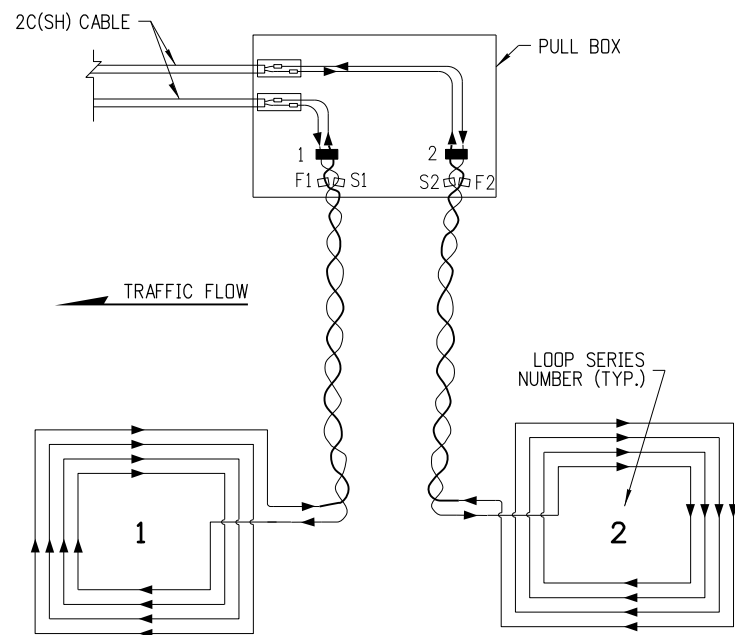
**TYPE 2 STOP LINE LOOP WIRING DIAGRAM  
SERIES SPLICE SHOWN**



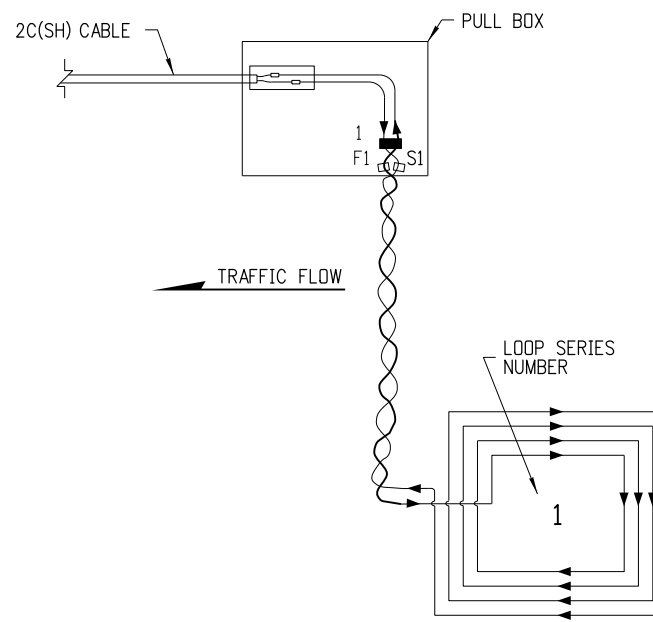
**LOOP NUMBERING LAYOUT DETAIL**



**LOOP NUMBER MARKING DETAIL**



**TYPE 2 SAMPLING LOOP WIRING DIAGRAM  
SERIES SPLICE SHOWN**



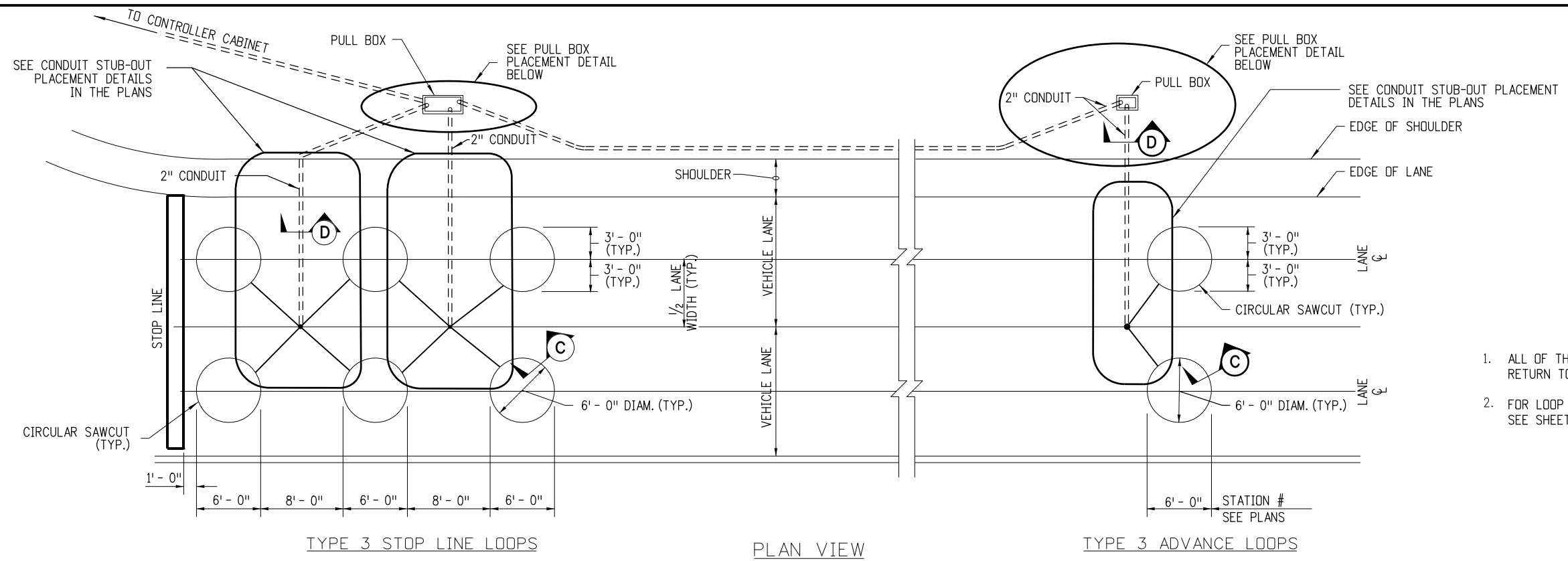
**TYPE 2 ADVANCE LOOP WIRING DIAGRAM**

**TYPE 2 INDUCTION LOOP**

**NOTE**

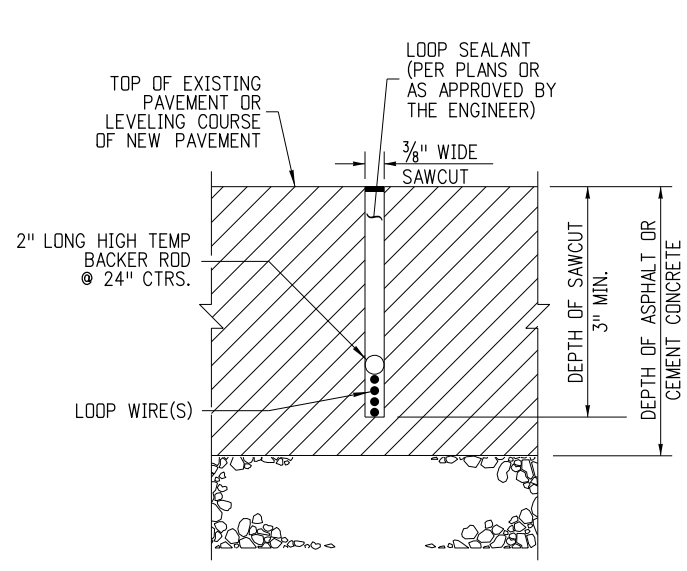
FOR WIRING AND CONDUIT LAYOUT, SEE CONDUIT STUB-OUT PLACEMENT DETAIL IN THE PLANS.

<b>Computer File Information</b>		<b>Sheet Revisions</b>		Colorado Department of Transportation 2829 W. Howard Place Denver, Colorado 80204 Phone: 303-757-9543 FAX: 303-757-9219 <b>Safety &amp; Traffic Engineering KCM</b>	<b>TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS</b>	<b>STANDARD PLAN NO.</b>
Creation Date: 07/04/12	Initials: KEN	Date:	Comments:			S-614-43
Last Modification Date:	Initials:					Sheet No. 4 of 10
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	(R-X)					
Drawing File Name: S-614-43_4of10	(R-X)					
CAD Ver.: MicroStation V8	Scale: Not to Scale	Units: English	(R-X)			

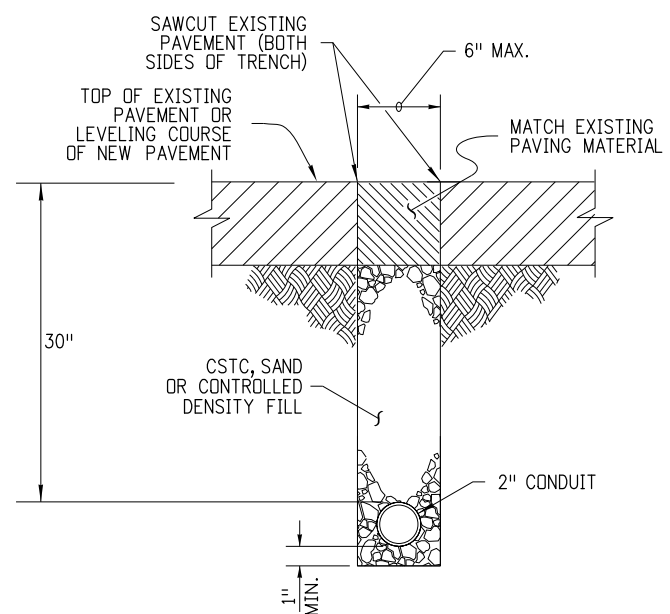


**NOTES**

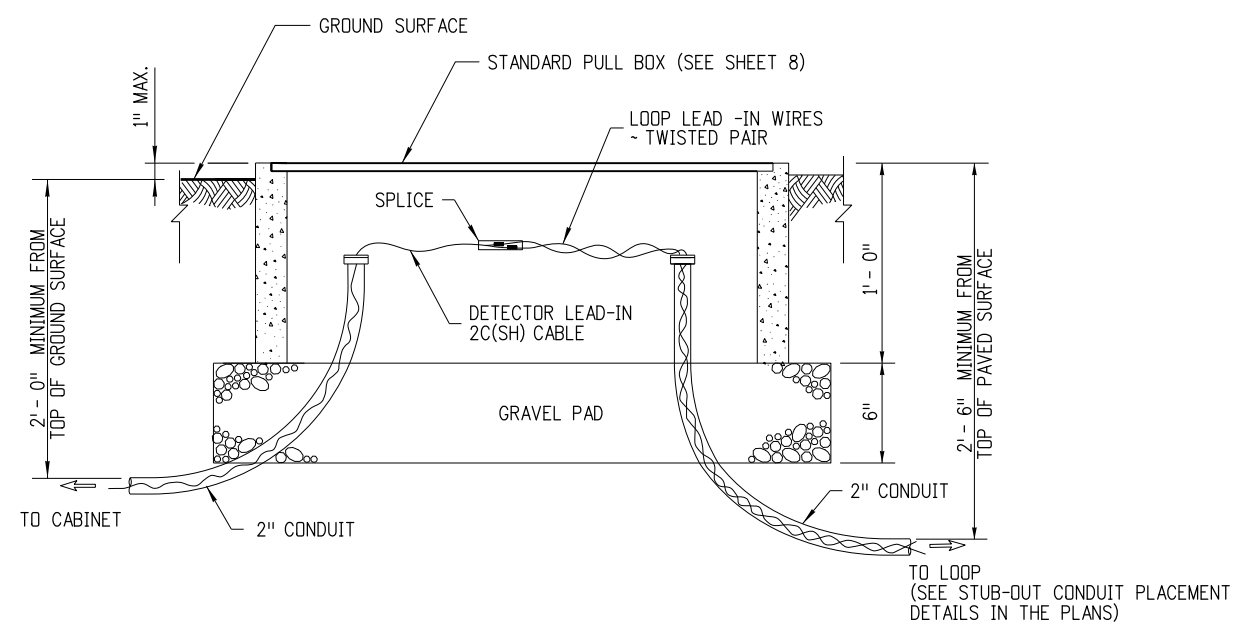
1. ALL OF THE LOOP LEAD-IN WIRES SHALL RETURN TO THE PULL BOX.
2. FOR LOOP NUMBERING LAYOUT DETAILS, SEE SHEET 7.



**SECTION C-C**




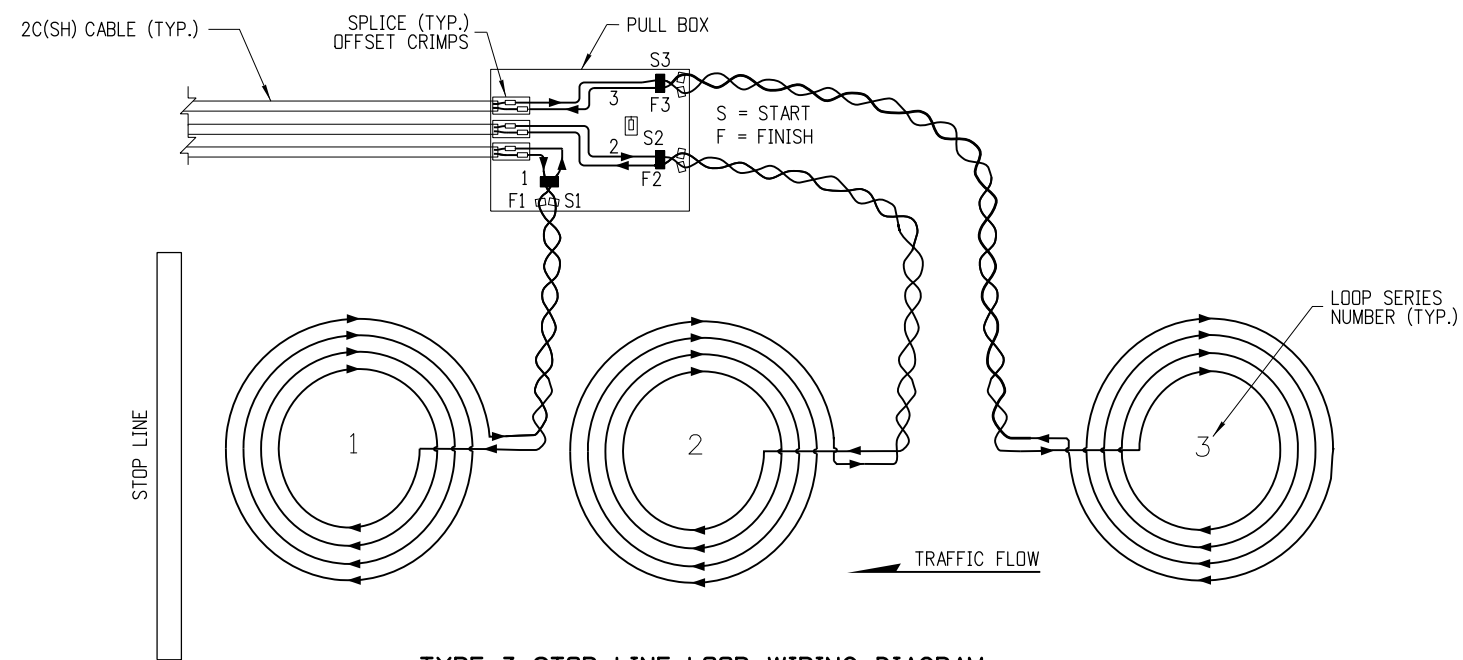
**SECTION D-D**



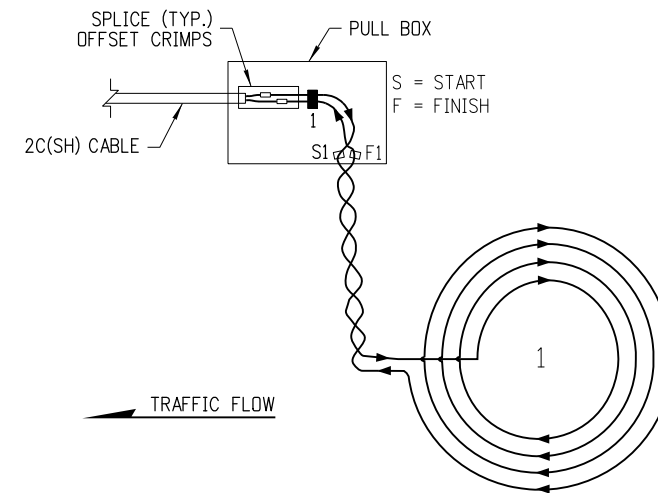
**PULL BOX PLACEMENT**

**TYPE 3 INDUCTION LOOP (FOR CONVENTIONAL HIGHWAYS)**

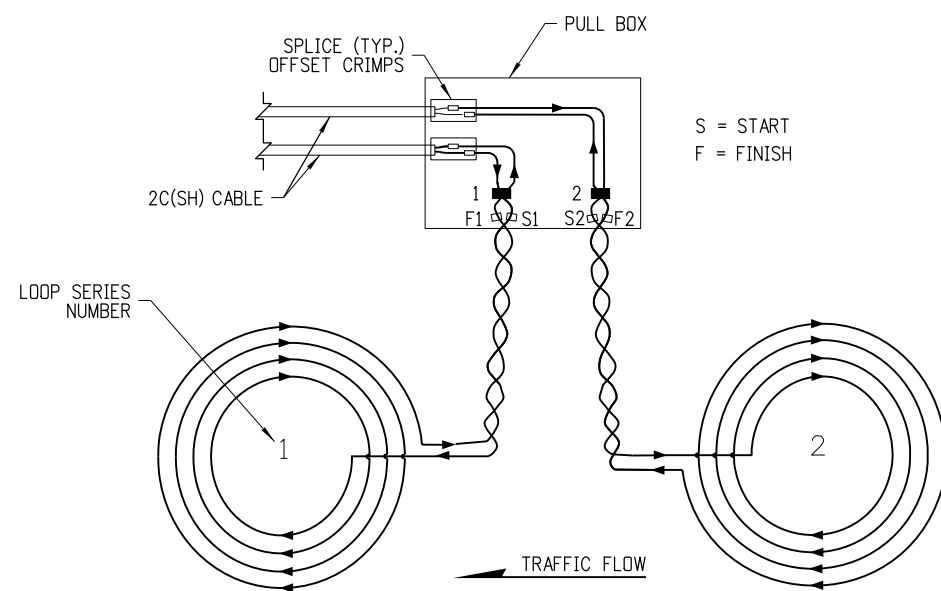
<b>Computer File Information</b> Creation Date: 07/04/12      Initials: KEN Last Modification Date:      Initials: Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans Drawing File Name: S-614-43_5of10 CAD Ver.: MicroStation V8    Scale: Not to Scale    Units: English		<b>Sheet Revisions</b> <table border="1"> <thead> <tr> <th>Date:</th> <th>Comments</th> </tr> </thead> <tbody> <tr> <td>(R-X)</td> <td></td> </tr> <tr> <td>(R-X)</td> <td></td> </tr> <tr> <td>(R-X)</td> <td></td> </tr> <tr> <td>(R-X)</td> <td></td> </tr> </tbody> </table>		Date:	Comments	(R-X)		(R-X)		(R-X)		(R-X)		<b>Colorado Department of Transportation</b>  2829 W. Howard Place Denver, Colorado 80204 Phone: 303-757-9543    FAX: 303-757-9219 <b>Safety &amp; Traffic Engineering      KCM</b>		<b>TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS</b> Issued By: Safety & Traffic Engineering Branch July 4, 2012		<b>STANDARD PLAN NO.</b> S-614-43 Sheet No. 5 of 10	
Date:	Comments																		
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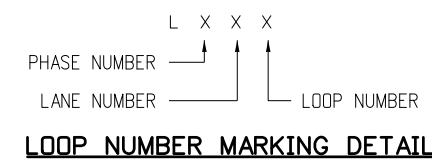
**TYPE 3 STOP LINE LOOP WIRING DIAGRAM**  
SERIES SPLICE SHOWN



**TYPE 3 ADVANCE LOOP WIRING DIAGRAM**



**TYPE 3 SAMPLING LOOP WIRING DIAGRAM**  
SERIES SPLICE SHOWN




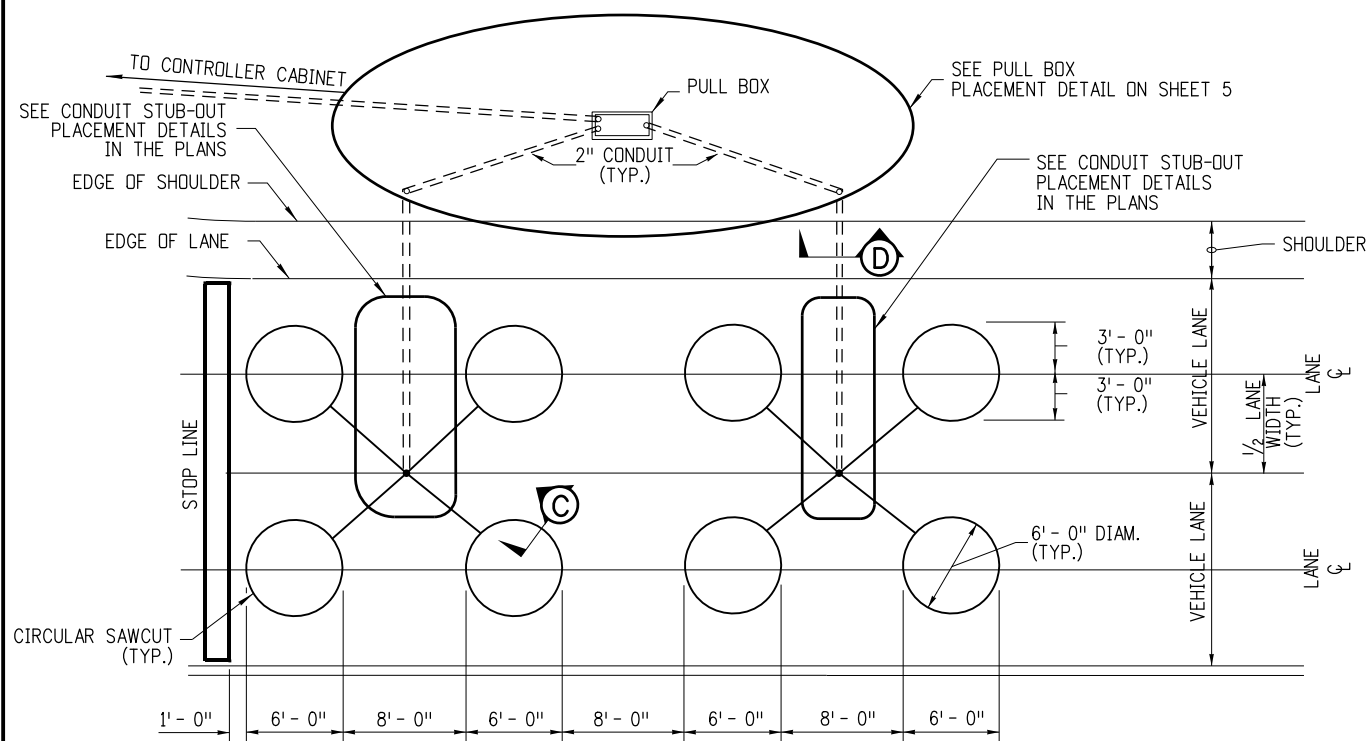
**LOOP NUMBER MARKING DETAIL**

**NOTES**

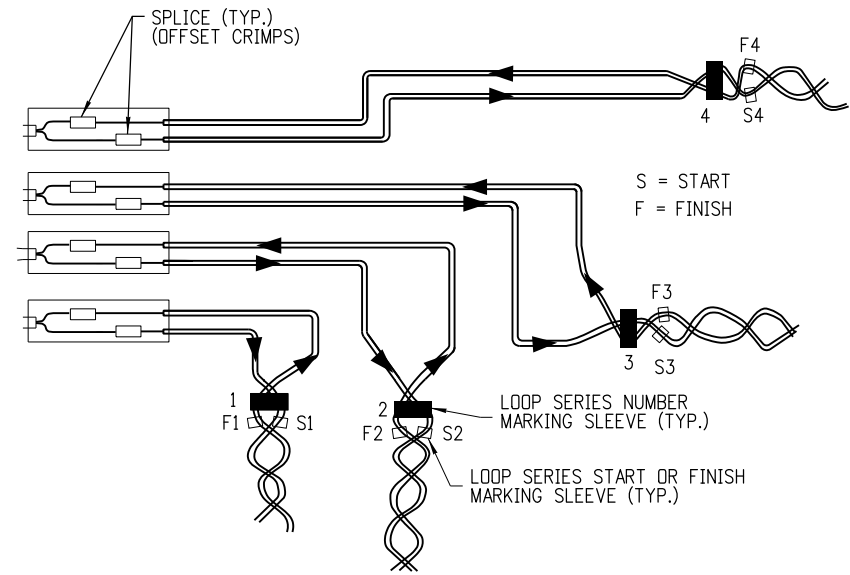
1. LOOP NUMBERING LAYOUT WILL BE SIMILAR TO LOOP NUMBERING LAYOUT DETAIL. SEE SHEET 7
2. FOR WIRING AND CONDUIT LAYOUT, SEE CONDUIT STUB-OUT PLACEMENT DETAIL IN THE PLANS.

**TYPE 3 INDUCTION LOOP**

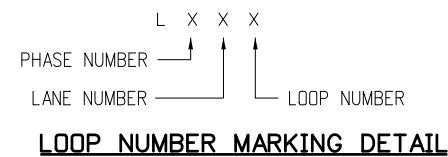
<b>Computer File Information</b>		<b>Sheet Revisions</b>		Colorado Department of Transportation  2829 W. Howard Place Denver, Colorado 80204 Phone: 303-757-9543 FAX: 303-757-9219 <b>Safety &amp; Traffic Engineering</b> <b>KCM</b>	<b>TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS</b>	<b>STANDARD PLAN NO.</b>
Creation Date: 07/04/12	Initials: KEN	Date:	Comments:			S-614-43
Last Modification Date:	Initials:					Sheet No. 6 of 10
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	(R-X)				Issued By: Safety & Traffic Engineering Branch July 4, 2012	
Drawing File Name: S-614-43_6of10	(R-X)					
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)					



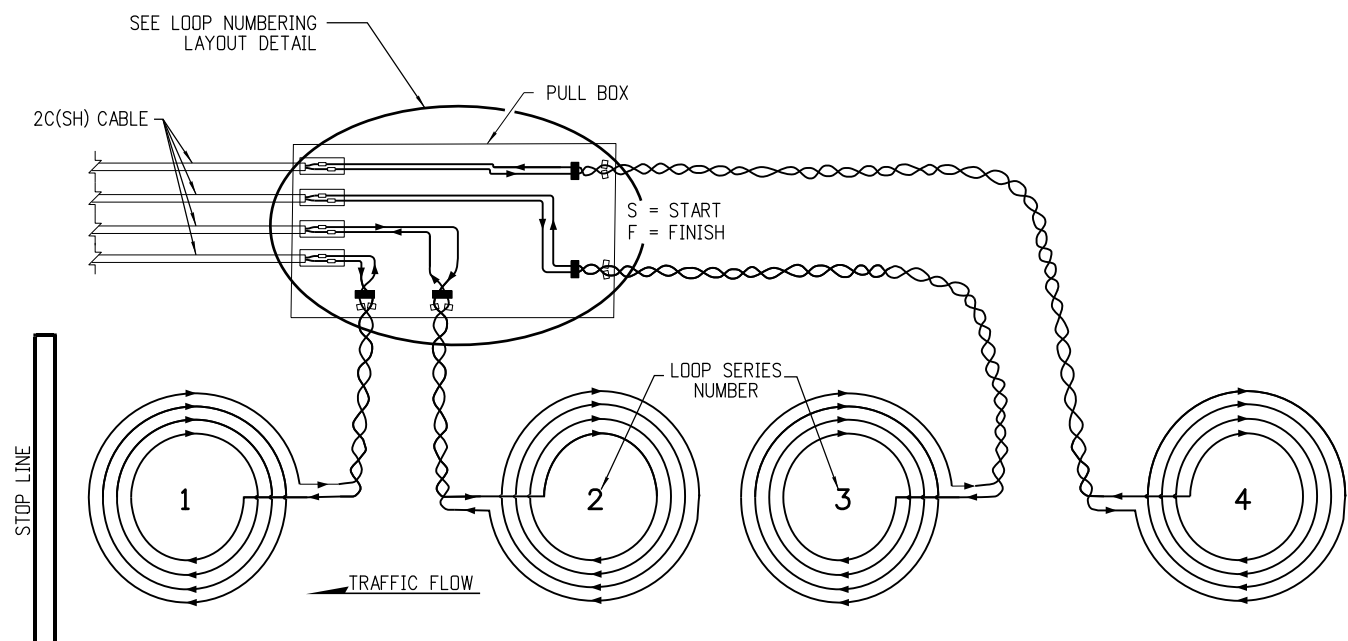
**TYPE 3A STOP LINE LOOPS - PLAN VIEW**



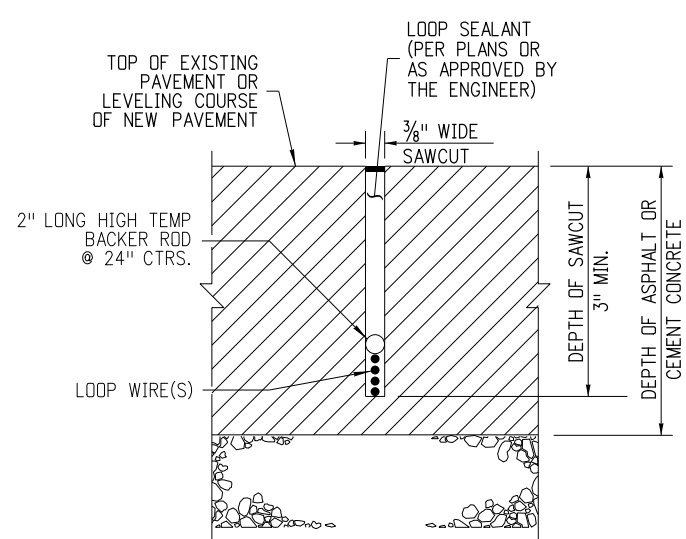
**LOOP NUMBERING LAYOUT DETAIL**



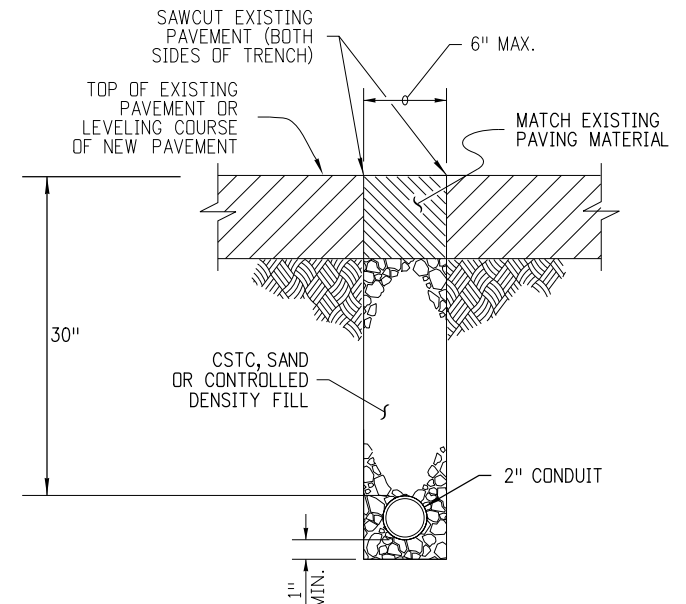
**LOOP NUMBER MARKING DETAIL**



**TYPE 3A STOP LINE LOOP WIRING DIAGRAM  
SERIES SPLICE SHOWN**



**SECTION C-C**




**SECTION D-D**

**TYPE 3 INDUCTION LOOP**

Computer File Information	
Creation Date: 07/04/12	Initials: KEN
Last Modification Date:	Initials:
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	
Drawing File Name: S-614-43_7of10	
CAD Ver.: MicroStation V8	Scale: Not to Scale Units: English

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Date:	Comments
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(R-X)	
(R-X)	

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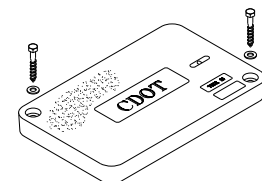
**TRAFFIC LOOP AND  
MISCELLANEOUS SIGNAL  
DETAILS**

Issued By: Safety & Traffic Engineering Branch July 4, 2012

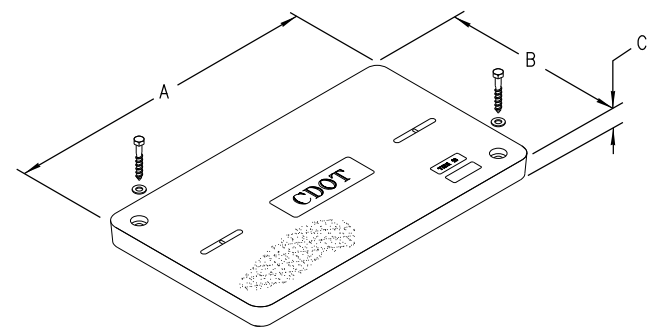
**STANDARD PLAN NO.**

**S-614-43**

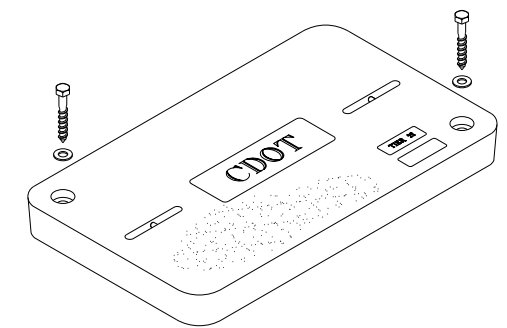
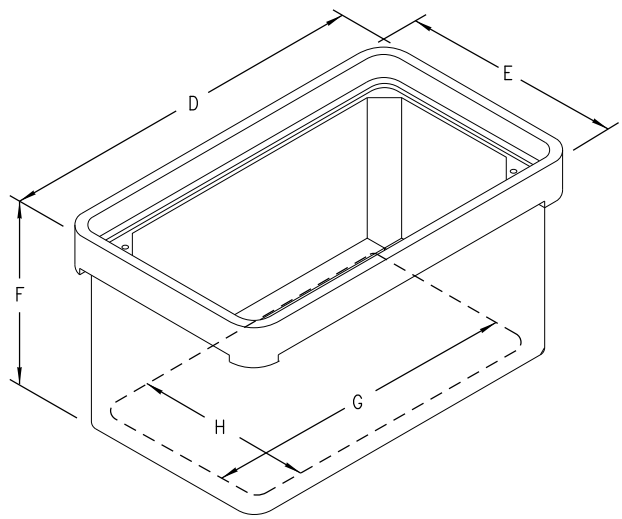
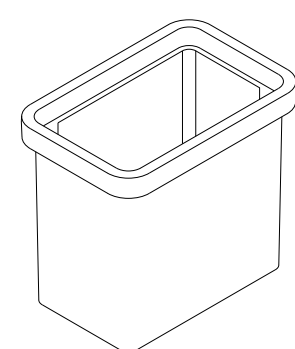
**Sheet No. 7 of 10**



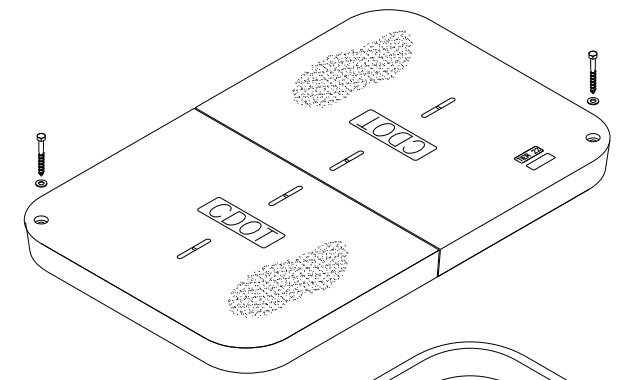
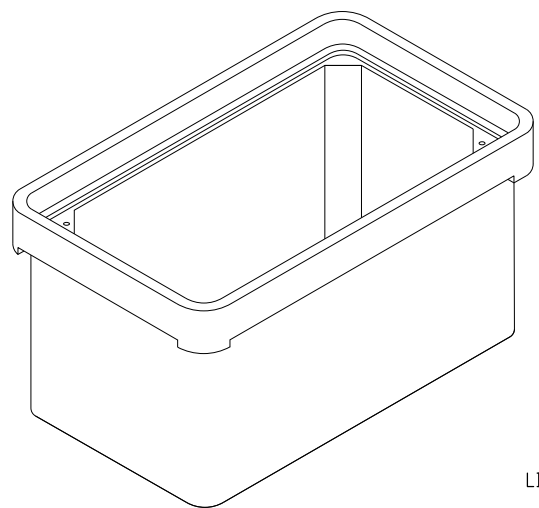
**TYPE 1**



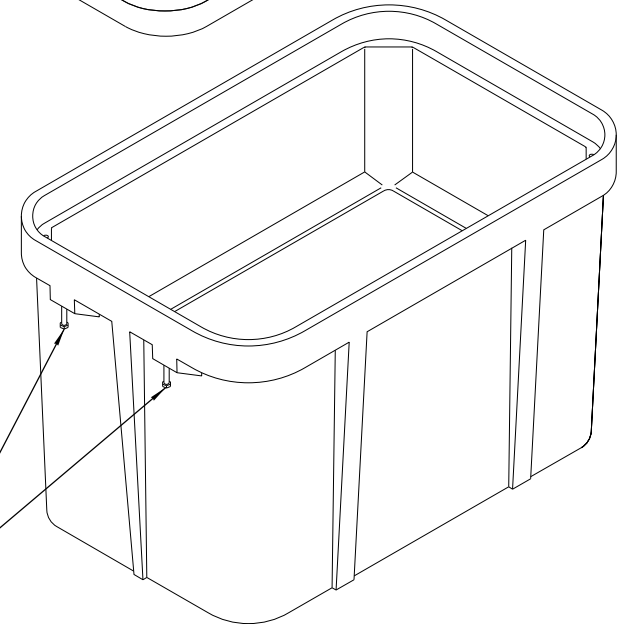
**TYPE 2**



**TYPE 3**



**TYPES 4 AND 5**



LIFTING BOLTS


**NOTES**

- PULL BOXES, PULL BOX COVERS AND EXTENSIONS SHALL BE MADE OF FIBERGLASS REINFORCED POLYMER CONCRETE. PULL BOXES SHALL BE VERIFIED BY A 3RD PARTY NATIONALLY-RECOGNIZED INDEPENDENT TESTING LABORATORY AS MEETING ALL TEST PROVISIONS OF THE LATEST ANSI/SCTE 77 SPECIFICATION FOR UNDERGROUND ENCLOSURE INTEGRITY, TIER 22 RATING. CERTIFICATION DOCUMENTS SHALL BE SUBMITTED WITH MATERIAL SUBMITTALS. THE PULL BOX SHALL HAVE A DETACHABLE COVER WITH A SKID-RESISTANT SURFACE AND HAVE THE WORDS "CDOT TRAFFIC" OR "CDOT COMM" CAST INTO THE SURFACE. PAINTING THE WORDS SHALL NOT BE ACCEPTED. MARKINGS SHOWING THE TIER 22 RATING MUST BE LABELED OR STENCILED ON THE INSIDE AND OUTSIDE OF THE BOX AND ON THE UNDER SIDE OF THE COVER. THE COVER SHALL BE ATTACHED TO THE PULL BOX BODY BY MEANS OF A MINIMUM 3/8" - 7 UNIFIED NATIONAL COURSE (UNC) STAINLESS STEEL PENTA HEAD BOLTS AND SHALL HAVE TWO LIFT SLOTS TO AID IN THE REMOVAL OF THE LID.
- PULL SLOTS SHALL BE RATED FOR A MINIMUM PULL OUT OF 3,000 POUNDS.
- TYPE 4 AND 5 PULL BOX COVERS SHALL BE A TWO-PIECE COVER.
- MAGNESIUM CHLORIDE TESTS SHOULD BE PERFORMED IN ACCORDANCE WITH THE LATEST ANSI/SCTE 77 SPECIFICATION FOR UNDERGROUND ENCLOSURE INTEGRITY, TIER 22 RATING.

**TABLE OF DIMENSIONS (MINIMUMS)**

TYPE	DESCRIPTION	DIMENSIONS (IN.)							
		A	B	C	D	E	F	G	H
1	PULL BOX - (11" X 18" X 12")	18 <sup>1</sup> / <sub>8</sub>	11 <sup>1</sup> / <sub>4</sub>	1 <sup>3</sup> / <sub>4</sub>	20 <sup>1</sup> / <sub>4</sub>	13 <sup>3</sup> / <sub>8</sub>	12	15 <sup>3</sup> / <sub>4</sub>	8 <sup>7</sup> / <sub>8</sub>
2	PULL BOX - (13" X 24" X 12")	23 <sup>3</sup> / <sub>4</sub>	13 <sup>3</sup> / <sub>4</sub>	2	25	15 <sup>1</sup> / <sub>2</sub>	12	19 <sup>1</sup> / <sub>4</sub>	9 <sup>3</sup> / <sub>4</sub>
3	PULL BOX - (17" X 30" X 12")	30 <sup>1</sup> / <sub>2</sub>	17 <sup>1</sup> / <sub>2</sub>	2	32 <sup>1</sup> / <sub>4</sub>	19 <sup>1</sup> / <sub>4</sub>	12	26 <sup>1</sup> / <sub>2</sub>	13 <sup>1</sup> / <sub>2</sub>
4	PULL BOX - (24" X 36" X 24")	35 <sup>5</sup> / <sub>8</sub>	24	3	37 <sup>5</sup> / <sub>8</sub>	26	24	30 <sup>1</sup> / <sub>8</sub>	18 <sup>1</sup> / <sub>2</sub>
5	PULL BOX - (30" X 48" X 24")	47 <sup>5</sup> / <sub>8</sub>	30	3	49 <sup>5</sup> / <sub>8</sub>	32 <sup>1</sup> / <sub>8</sub>	24	45 <sup>5</sup> / <sub>8</sub>	28 <sup>1</sup> / <sub>8</sub>

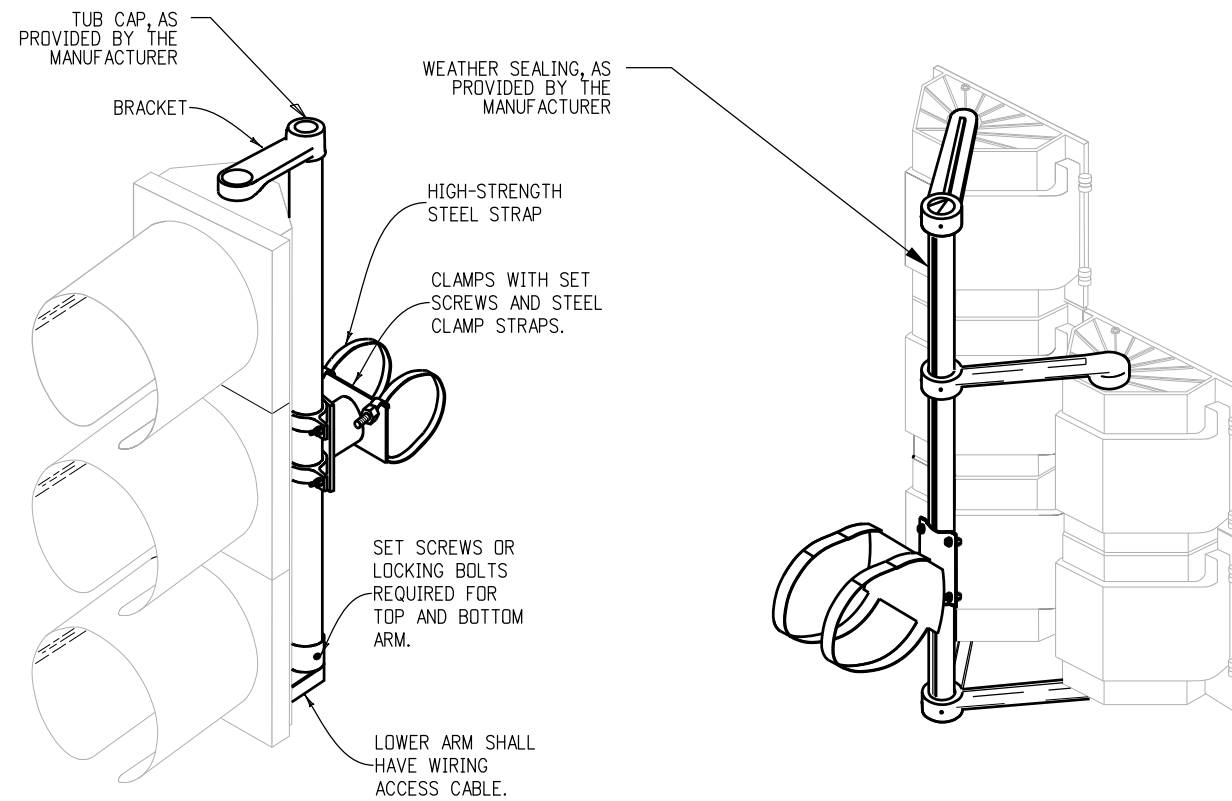
**STANDARD PULL BOXES**

<b>Computer File Information</b>		<b>Sheet Revisions</b>	<b>Colorado Department of Transportation</b>	<b>TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS</b>	<b>STANDARD PLAN NO.</b>
Creation Date: 07/04/12	Initials: KEN	Date:	 2829 W. Howard Place Denver, Colorado 80204 Phone: 303-757-9543 FAX: 303-757-9219	Issued By: Safety & Traffic Engineering Branch July 4, 2012	S-614-43
Last Modification Date:	Initials:	Comments:			Sheet No. 8 of 10
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans	(R-X)				
Drawing File Name: S-614-43_8of10	(R-X)				
CAD Ver.: MicroStation V8	Scale: Not to Scale	Units: English	<b>Safety &amp; Traffic Engineering</b>		

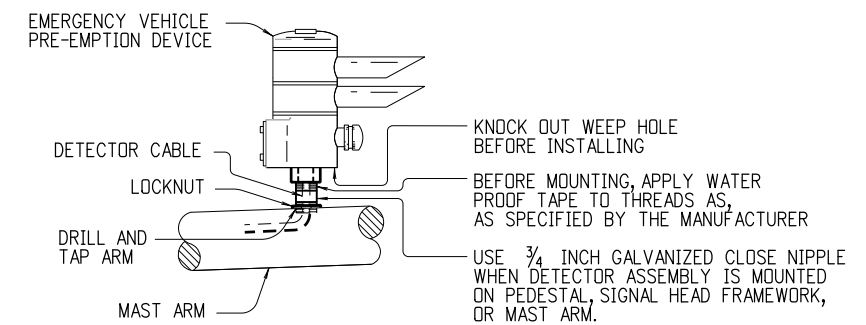


**NOTES**

1. SIGNAL HEAD CONFIGURATIONS SHALL BE AS SHOWN ON PLANS
2. INSTALL MOUNTING BRACKETS ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.
3. FOR MOUNTING OVERHEAD SIGNS, EXCEPT FOR LIGHTED STREET SIGNS, ON MAST ARMS, SEE STANDARD PLAN S-614-20, USING 3/4" INCH WIDE BANDING.
4. LIGHTED STREET NAME SIGNS SHALL UTILIZE ASTRO-TYPE MOUNTING BRACKETS DESIGNED FOR THE REQUIRED DESIGN LOADING AND BE FREE-SWINGING TO REDUCE WIND LOADING EFFECT.




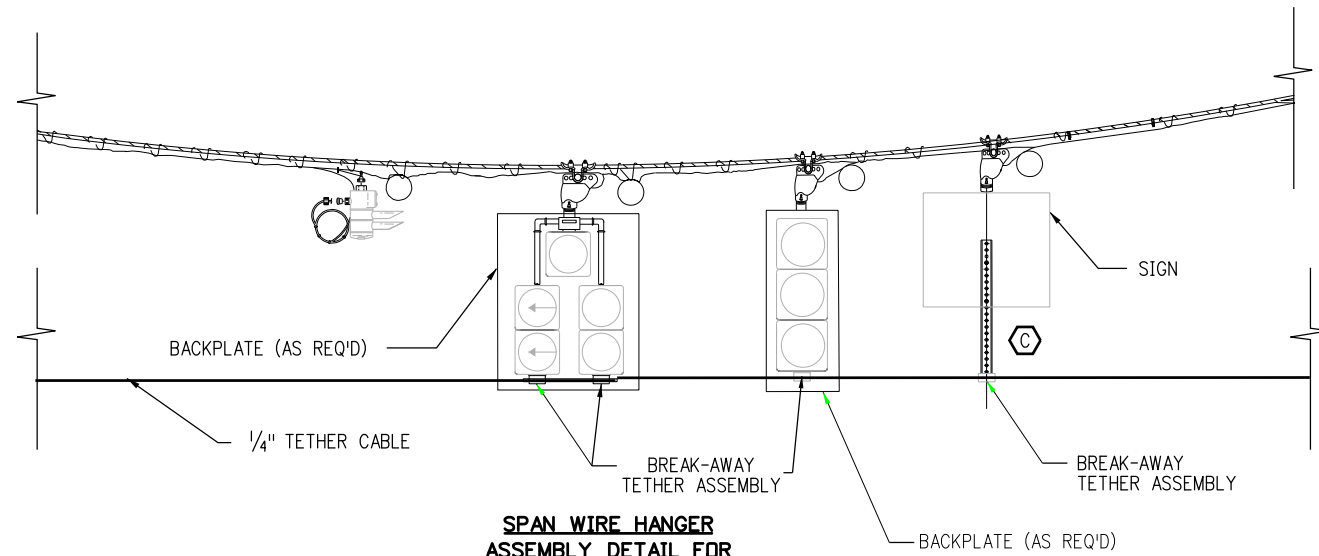
**ASTRO-TYPE MOUNTING BRACKET**



**EMERGENCY VEHICLE PRE-EMPTION DEVICE MOUNTING DETAIL**

**MAST-ARM MOUNTING BRACKETS**

<b>Computer File Information</b>		<b>Sheet Revisions</b>		 <p>Colorado Department of Transportation 2829 W. Howard Place Denver, Colorado 80204 Phone: 303-757-9543 FAX: 303-757-9219 Safety &amp; Traffic Engineering KCM</p>	<p><b>TRAFFIC LOOP AND MISCELLANEOUS SIGNAL DETAILS</b></p> <p>Issued By: Safety &amp; Traffic Engineering Branch July 4, 2012</p>	<b>STANDARD PLAN NO.</b>
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Last Modification Date:	Initials:					
Full Path: www.coloradodot.info/library/traffic/traffic-s-standard-plans						
Drawing File Name: S-614-43_9of10						
CAD Ver.: MicroStation V8	Scale: Not to Scale	Units: English			<b>Sheet No. 9 of 10</b>	

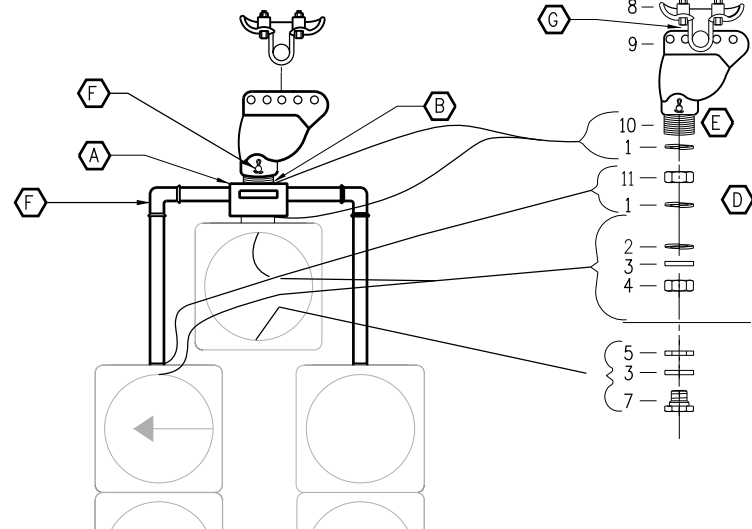


**LEGEND**

- (A) TOP BRACKET CENTER HUB SHALL BE MINIMUM 3.5 INCH SQUARE AND 3 INCHES DEEP OR EQUAL VOLUME. SERRATION CAST IN HUB, TABBED OR SERRATED LOCKRING, OPENINGS SHALL BE THREADED.
- (B) NIPPLE LENGTH DEPENDS ON SPAN HEIGHT.
- (C) SIGN SUPPORT BRACKET ASSEMBLY SHALL UTILIZE SPAN WIRE CLAMP ADJUSTMENT AND BE ADJUSTABLE TO ACCOMMODATE VARYING SPAN HEIGHT. TETHER SUPPORT BAR SHALL BE ATTACHED TO THE SIGN USING A MINIMUM OF TWO (2), 3/16 INCH BOLTS, SPACED A MINIMUM OF 6 INCHES APART.
- (D) APPLY SILICONE CAULK BETWEEN OR AROUND SERRATED LOCKRING AND HOUSING.
- (E) ALL THREAD
- (F) SETSCREW (SQUARE OR ALLEN) ON ALL FITTINGS.
- (G) INSTALL STAINLESS STEEL WASHER ON THE INSIDE OF THE COTTER PIN. COTTER PIN AND WASHER SHALL BE ON THE SIDE OF THE HANGER AWAY FROM THE SIGNAL CABLES.

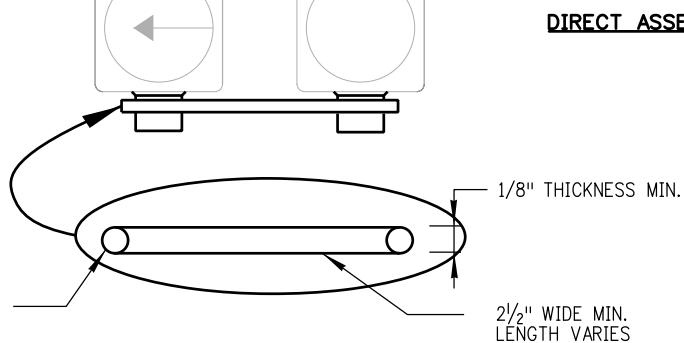
**SPAN WIRE HANGER  
ASSEMBLY DETAIL FOR  
TRAFFIC SIGNALS**

**ITEM DESCRIPTION FOR ASSEMBLY DETAIL**



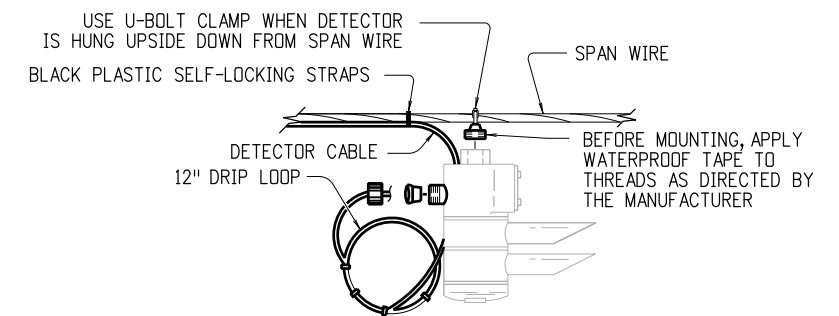
- 1 - SERRATED TABBED LOCKRING, ALUMINUM (TAB MUST BE FULL WIDTH OF RING)
- 2 - GASKET, NEOPRENE
- 3 - WASHER, STEEL
- 4 - HEX NUT, STEEL
- 5 - CONDUIT LOCKNUT, STEEL
- 6 - BUSHING PLASTIC (ONLY IN JUNCTION BOX OR NIPPLED DOWN TRAFFIC SIGNAL)
- 7 - OCTAGONAL CAP, ALUMINIUM
- 8 - SPAN WIRE CLAMP
- 9 - WIRE OUTLET BODY, STEEL, FEMALE ONLY
- 10 - NIPPLE, STEEL
- 11 - HEX NUT, STEEL, NOTCHED WITH SETSCREWS

**DIRECT ASSEMBLY DETAIL**



**BREAK-AWAY TETHER  
ASSEMBLY DETAIL**

**SPAN WIRE MOUNTING BRACKET DETAILS**




**SPAN WIRE MOUNTING DETAIL  
FOR EMERGENCY VEHICLE PRE-EMPTION DEVICE**

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Colorado Department of Transportation



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Safety & Traffic Engineering KCM

**TRAFFIC LOOP AND  
MISCELLANEOUS SIGNAL  
DETAILS**

Issued By: Safety & Traffic Engineering Branch July 4, 2012

**STANDARD PLAN NO.**

**S-614-43**

**Sheet No. 10 of 10**